agreeable contrast to that found in similar manuals. The calculation of corrections and the discussion of the effect of the errors of observation upon the result, as well as the methods of least squares and of approximation, will be found particularly clear, complete and useful. Indeed, much of the unique value of the book lies in its many suggestions as to simple manipulative methods, receipts and general good advice. It is these little 'tricks of the trade' that distinguish the successful experimental investigator from the helpless theorizer.

The body of the book contains concise, clear instructions for the determination of about every quantity that may be of interest to the experimental physicist, together with numerous demonstrations and illustrative examples. An excellent feature of this part is the frequent reference to the original investigations from which the methods were derived.

The absolute system of units is happily not the novelty to-day that it was when Kohlrausch introduced it into the Leitfaden; nevertheless his clear and complete exposition of its principles, its units and their values is very acceptable even now, and gives in some twenty pages the essentials of the whole matter.

The thirty pages of carefully selected tables form a very agreeable and striking contrast to some similar books recently offered in this country.

Some teachers have lamented the absence of pictures of instruments, but it would appear inconsistent with the general nature of the book if specific pieces of apparatus were represented. It is better and probably easier for a pupil to specialize from a diagram to any corresponding instrument than from one instrument to another of radically different appearance, though similar in principle.

The English translation of the last edition of Kohlrausch is very good, but not so good as the original because the translator has permitted himself to make changes.

A Systematic Treatise on Electrical Measurements. By HERSCHEL C. PARKER. Spon & Chamberlain, London and New York.

Mr. Parker, confining himself to a smaller field, and rather to the technical than the theoretical aspect of the subject, has succeeded in following the good example of Kohlrausch and sets forth what such a course should teach, rather than what is taught under the conditions at Columbia.

Particularly valuable is the strictly systematic way in which the subject is treated, enabling the student to see at a glance the relative merits of different instruments and methods for the various measurements of the same class, and to choose the apparatus and method best adapted to his particular determination. Although giving the principle and construction of the latest forms of electrical measuring instruments, the author has done better than some others, who could not resist the temptation to use old cuts or introduce trade pictures of apparatus. His diagrams and outline cuts show the fundamental parts most satisfactorily and enable the reader easily to imagine the brass and hard-rubber accompaniments. The book is sure to be useful to the electrical engineer, as well as to the investigator, who will gladly welcome future editions with the revision and additions which the author seems to feel desirable.

WILLIAM HALLOCK.

Bibliography—A Study of Resources. CHARLES SEDGWICK MINOT. In *Biological Lectures delivered at the Marine Biological Laboratory of Wood's Holl in the summer session of 1895.* Boston, Ginn & Company. 1896. P. 149–168.

Short surveys of the present standpoint of bibliography from the point of view of the special sciences should prove advantageous both for the specialist and for the bibliographer. To the former such surveys would be mainly useful in giving him a systematic guide through the mass of publications which he must work over to find the particular literature needed for his investigations. To the latter—I am here thinking especially of the librarian—they would make plain the connection of bibliography with the special sciences of which bibliography is the handmaid. Professor Minot's account of biological bibliographical literature is a good example of what such a survey should be. He does not drown his subject in enumeration of details, but describes and considers the main

guides to biological literature. One could wish to have as an appendix to the lecture a list, with full bibliographical details, of the publications treated, showing especially the connection and succession of the numerous German *Jahresberichte* and *Anzeiger*. As it is, however, the lecture makes not only an admirable introduction to biological bibliography, but also very interesting reading. The bulk of the lecture is devoted to the bibliographical publications in question, which are divided into four classes: (1) Standard bibliographies; (3) Incidental bibliographies; (3: a.) Current bibliographies appearing annually; (3: b.) Current bibliographies appearing at intervals of less than a year. As an introduction Professor Minot gives an interesting account of his own methods of dealing bibliographically with his literary material and with his library. In connection herewith he also gives some few rules for dealing with a scientific subject from the point of view of the bibliographer, emphasizing that the *title* of an article 'should be as brief as possible and nevertheless indicate the contents;' that *a table of contents* should be used in longer articles, say of 40 to 100 pages; that *reprints* should have the paging of the original publications; and that *references to other authorities* should be carefully arranged.

Aksel G. S. Josephson.
The John Crerar Library, Chicago.

Indiana—A Century of Changes in the Aspects of Nature. A. W. Butler. President's Address. From Proceedings Indiana Academy of Sciences, No. V., 1895.

This pamphlet of a dozen pages gives an interesting account of the changes in the natural conditions in Indiana, brought about by the advent of the white man, the passing away of the virgin forests, the destruction of the herds of buffaloes, the elk, the flocks of wild turkeys, the pigeons and many more.

In the valleys of the Wabash and Whitewater there were magnificent forests of deciduous trees, which probably could not be surpassed anywhere in America. Forty-two trees in the Wabash valley attained a height above one hundred feet, the tallest recorded being a tulip poplar (*Liriodendron tulipifera L.*), 190 feet high. The bison or buffaloes had well marked roadways in some of the river valleys, along which countless thousands passed annually, chiefly on their journey to and from the Big Bone Lick, in Kentucky. Elk and deer were common, bear and wolves quite abundant, beaver were found in many localities, while the wild cat Canada porcupine and panther were numerous. Wild turkeys and pigeons and the beautiful little Carolina paroquets were more than abundant, but have been almost, or in a great measure, exterminated. The hog assisted in the killing of the rattlesnakes and copperheads.

Thus, with the aid of the gun, of fire and the axe, was the land, all things being considered, speedily made ready for the plow, and a new life of sparrows, of little snakes, humble bees and grasshoppers took possession of the fields. More than half of humanity will declare that the destruction was unavoidable and even commendable, but we trace a spirit of regret running through all of Mr. Butler's admirable address, and this speaks for the rest of mankind, who would fain have saved a tract of virgin forest where they might resort to contemplate some of the wonders of the world.

W. T. Davis.

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System der Bakterien. W. Migula. Jena, Gustav Fischer. 1897. Pp. viii + 368 and 6 plates.

Citizen Bird. Mabel Osgood Wright and Elliott Coues. New York and London, The Macmillan Company. 1897. Pp. xiv + 419. $1.50.

Some Unrecognized Laws of Nature. Ignatius Singer and Lewis H. Berens. New York, D. Appleton & Co. 1897. Pp. xvi + 511. $2.50.

Les huiles Minérales. François Miron. Paris, Gauthier-Villars et fils. Pp. 194.

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The University Geological Survey of Kansas. Erasmus Haworth. Topeka. 1897. Vol. II. Pp. 318.